

**CTS**

*Center for Technical Studies  
on Security, Energy, and Arms Control*

---

**“Remarks” about Minimum Deterrence**

**Herbert F. York**

This paper was presented at the Lawrence Livermore National Laboratory workshop: *The Role of Nuclear Weapons in the Year 2000*, October 22–24, 1990

Sponsored by:

**Center for Technical Studies on Security, Energy, and Arms Control**

**January 25, 1991**



Lawrence Livermore National Laboratory  
University of California, Livermore, California 94551



CTS-12-90

# **“Remarks” about Minimum Deterrence**

**Herbert F. York**

This paper was presented at the Lawrence Livermore National Laboratory workshop: *The Role of Nuclear Weapons in the Year 2000*, October 22–24, 1990

Sponsored by:  
**Center for Technical Studies on Security, Energy, and Arms Control**

**January 25, 1991**

Each manuscript from this workshop is a separate publication. These separate documents can be collected in a binder as a complete proceedings (CONF-9010247) of this workshop



**Lawrence Livermore National Laboratory**  
University of California, Livermore, California 94551

# "Remarks" about Minimum Deterrence

Herbert F. York

University of California, San Diego

LLNL, OCT 22-24, 1990

I will make some "remarks" about minimum deterrence. I choose this particular word, because I will present neither a complete analysis nor a sermon. To me minimum deterrence is minimal in two different senses: one in terms of its goals and the other in terms of its means.

In terms of goals, the purpose is to deter the use of nuclear weapons by someone else and not something broader than that. And in terms of means, minimum deterrence involves very small numbers. To give my conclusions away at the beginning and then explain them in more detail as I go on, I am thinking in terms of about 100 nuclear weapons, not the 600 that the French or the British seem to think are needed for minimum deterrence or the several thousand that are suggested for the American forces later at the end of this century, but something in the neighborhood of 100. Minimum deterrence necessarily involves plans for the use of these weapons against the potential enemy's most precious targets, which is another one of the euphemisms that we always use when we talk about nuclear weapons. A clearer translation of this notion of most precious targets is cities, which of course raises major moral issues that I will also discuss later.

As I see it, the notion of minimum deterrence is entirely consistent with the idea of no first-use. In fact, it is almost the same idea. Whether it is consistent with extended deterrence depends on what is meant by extended deterrence. The notion of minimum deterrence is obviously not consistent

with the idea of using nuclear weapons in the event someone else commits a major non-nuclear act, but it is not necessarily inconsistent with the notion that one might provide some kind of a nuclear umbrella to a particular ally or group of allies—against a nuclear attack and only against a nuclear attack against them.

Like mutual-assured destruction, minimum deterrence is not an objective that is intrinsically desirable, it is simply the best of what is practically obtainable from a bad set of possibilities. Supporting it is a recognition of the fact that nuclear weapons, and the terrible threats that inhere in them, simply cannot be eliminated from the world. To be clear with regard to my view about why they cannot be eliminated, I am thinking in terms of technology. A world that can produce modern aircraft and solid-state thin-screen color television can readily produce or reproduce nuclear weapons, even if they were all somehow destroyed at one particular moment.

In these remarks, I will try and give some idea of the derivation of the number that I presented. I will comment further on the moral issue that the notion of deliberately targeting the most precious targets raises, and I will also make some remarks about stability. These last two matters, in particular, are often raised as objections to strategies of minimum deterrence. I want to acknowledge the fact that I am aware of those objections and have at least the initial elements of an answer to them.

## Number of Nuclear Weapons

With regard to the number, I arrived at it by first working up from zero, then working down from where we are, and discovering something in-between that fits my particular set of notions.

With regard to working up from zero, I have long regarded the remarks that McGeorge Bundy made, shortly after he left his position in the mid-1960s as National Security Advisor to



Presidents Kennedy and Johnson, as cutting to the core of the situation. In sum, he said that, in the real world of real political leaders, any policy, which in advance was known to bring a single hydrogen weapon on a city of one's own country, would be regarded in advance as a catastrophic blunder. Ten weapons on one's own country would be a disaster beyond history, and then he ended by saying that 100 is unthinkable. So the number that is necessary to deter at least the people that I have some direct understanding of (Western and American leaders) is somewhere in the range of 1, 10, or 100. I think that it is closer to 1 than it is to 100, but of course there has to be some reasonable assurance of the likelihood that nuclear retaliation really would happen for that deterrence to be effective.

I am not sure about other leaders. Names of supposedly irresponsible third world leaders are often thrown out, and the suggestion is made that the people who took so many tens of millions of casualties in World War II cannot be deterred merely by the threat of the loss of a single city, or that there will always be crazy people out there. And there may very well be irrational people with nuclear weapons, but I do not think they practice the kind of calculus that is relevant to the notion that even 5000 deter. Thus, as far as rational people approaching the question of nuclear weapons falling on themselves, somewhere between 1, 10, and 100 is the answer to what it takes to deter, and for irrational leaders there may be no answer at all.

Coming from the top down, one criticism of reductions, which people who are fairly passionate about these questions sometimes make, is that it does not make any difference. Drop the number from 12,000 to 6000, and the effect of 6000 on civilization and mankind is nearly the same as the effect of 12,000, so it does not make any difference. Or drop from 6000 to 3000, and it does not make much difference either, because 3000 weapons still contain such an enormous capability for death and destruction. I admit there is something to that notion although it clearly depends on precisely how they are targeted. But there is a point at which reductions begin to make a real difference, and that point is where the number of weapons has been cut to the point that no matter how the leaders decided to use them, they could not produce something substantially worse than War World II. I do not know exactly where that point is, but I estimate that it is somewhere in the neighborhood of 100. I am sure it is not in the neighborhood of 1000. It may in truth be less than 100, but it is somewhere in that neighborhood.

I simply cannot be more precise than this, but I have given you my two ways of approaching this number, coming from the bottom up and trying to think of what it would really take to deter an American President or someone else who thinks rationally, and coming down from the top and trying to arrive at a number where the reduction really would make a difference, and where no matter what the later decisions might be, the result would be no worse than, as I said, World War II.

future  
concept;  
have about  
Peace  
War II

## Moral Issues

Turning to the moral issues, it is commonly said that deliberately targeting cities is simply unacceptable and that we must have some kind of strategy based on destroying military targets. A lot of what Richard Wagner said in his discussion at this Workshop is relevant to this. My particular answer to this problem is that the other strategies, the strategies that involve so-called military targets or counterforce strategies, always necessarily involve a much larger number of nuclear weapons. By the time one looks at what the military targets (usually called military/industrial targets) are in any real plan, one finds, for instance, that they include all the naval bases, which include most American big

cities on the coasts. One finds that they also include the major centers of command, communication, transportation, etc., and that striking these military/industrial targets in a way designed to remove the enemy's military capability leads to a number of potential civilian casualties that is at least as large as the number that would be inherent in a deliberate attack involving a smaller number of weapons against the cities themselves. The main difference is that, in the case of an attack against the military targets, people are collateral damage; and, in the minimum deterrence case, they are deliberate damage. I do not see an important moral distinction between those two cases. I do agree



with the view of the Catholic bishops that the use of nuclear weapons against the large civilian populations and the threat of their use are both wrong. But the situation, as I see it, is that we are currently faced with a number of choices, all

of which are bad, which is why I said at the beginning that I do not regard minimum deterrence as a desirable objective, but simply the best that is within reach.

## Stability

My last point concerns stability. It is often said that small numbers are intrinsically less stable than large numbers, and there are various reasons given for that claim. For example, if we had an agreement covering what the allowed number would be, then cheating by 100 at a level of 10,000 would be one thing, and cheating by 100 at a level of 100 would be quite different. This is true when discussing force-against-force, in the standard counterforce situation, but if we restrict our thinking to discussing minimum deterrence and countervalue targeting, then I believe it is possible to solve this particular problem by putting special technical emphasis on force survivability. When one gets down to numbers this small, the survivability question really becomes quite different from the one we have become familiar with, and I think that it becomes amenable to more direct and more certain answers. To give just two examples: one might deploy these

100 as single weapons on single missiles with each missile deployed on a separate ship; or one might deploy them in a larger number of holes (i.e., missile silos) located two miles or more apart out in Nevada on military reservations, with the total number of holes equal to twice the number of nuclear weapons, not just those in the hands of a potential enemy, but twice the number of nuclear weapons that all other countries have together. If one is down to something like 100 weapons per country, then multiplying all nuclear weapons in the world by two still leads to a number of holes that is feasible to put somewhere like that. I am not trying to work out the technical details here, but I do think that the notion of survivability becomes so different at very small numbers than it is at large numbers, that the simple idea that it is necessarily less stable because cheating becomes too significant, does not apply.

sub?

MULTIPLAT.  
MIN. DET.

## Summary

I do not regard these remarks to be a comprehensive analysis of the situation, but, when I saw the original agenda for this Workshop and found nothing on it that looked anything like this, I thought that a discussion of the future of nuclear weapons ought to have somebody paying some attention to this particular goal, which despite some of the remarks we have heard here, is in fact held by a great many people whom I regard as serious. Of course, the possibility of moving so far is, to be realistic, very poor at the present

time. It is clear that numbers more like those Mike May and others talk about (5000 or so) are much more realistic, much more possible in the near term, and I agree with the kind of analysis that leads to those numbers for the near term. The place that I disagree is when they say that this is a long-term asymptote. I think of this (5000) solely as an intermediate number, which may in fact last for a number of years, but I do not think that it is the proper asymptotic number for the number of nuclear weapons.

1990

## Acknowledgment

This work was published and distributed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract W-7405-Eng-48.



*Technical Information Department • Lawrence Livermore National Laboratory*  
University of California • Livermore, California 94551



Presidents Kennedy and Johnson, as cutting to the core of the situation. In sum, he said that, in the real world of real political leaders, any policy, which in advance was known to bring a single hydrogen weapon on a city of one's own country, would be regarded in advance as a catastrophic blunder. Ten weapons on one's own country would be a disaster beyond history, and then he ended by saying that 100 is unthinkable. So the number that is necessary to deter at least the people that I have some direct understanding of (Western and American leaders) is somewhere in the range of 1, 10, or 100. I think that it is closer to 1 than it is to 100, but of course there has to be some reasonable assurance of the likelihood that nuclear retaliation really would happen for that deterrence to be effective.

30 I am not sure about other leaders. Names of supposedly irresponsible third world leaders are often thrown out, and the suggestion is made that the people who took so many tens of millions of casualties in World War II cannot be deterred merely by the threat of the loss of a single city, or that there will always be crazy people out there. And there may very well be irrational people with nuclear weapons, but I do not think they practice the kind of calculus that is relevant to the notion that even 5000 deter. Thus, as far as rational people approaching the question of nuclear weapons falling on themselves, somewhere between 1, 10, and 100 is the answer to what it takes to deter, and for irrational leaders there may be no answer at all.

Coming from the top down, one criticism of reductions, which people who are fairly passionate about these questions sometimes make, is that it does not make any difference. Drop the number from 12,000 to 6000, and the effect of 6000 on civilization and mankind is nearly the same as the effect of 12,000, so it does not make any difference. Or drop from 6000 to 3000, and it does not make much difference either, because 3000 weapons still contain such an enormous capability for death and destruction. I admit there is something to that notion although it clearly depends on precisely how they are targeted. But there is a point at which reductions begin to make a real difference, and that point is where the number of weapons has been cut to the point that no matter how the leaders decided to use them, they could not produce something substantially worse than War World II. I do not know exactly where that point is, but I estimate that it is somewhere in the neighborhood of 100. I am sure it is not in the neighborhood of 1000. It may in truth be less than 100, but it is somewhere in that neighborhood.

I simply cannot be more precise than this, but I have given you my two ways of approaching this number, coming from the bottom up and trying to think of what it would really take to deter an American President or someone else who thinks rationally, and coming down from the top and trying to arrive at a number where the reduction really would make a difference, and where no matter what the later decisions might be, the result would be no worse than, as I said, World War II.

## Moral Issues

Turning to the moral issues, it is commonly said that deliberately targeting cities is simply unacceptable and that we must have some kind of strategy based on destroying military targets. A lot of what Richard Wagner said in his discussion at this Workshop is relevant to this. My particular answer to this problem is that the other strategies, the strategies that involve so-called military targets or counterforce strategies, always necessarily involve a much larger number of nuclear weapons. By the time one looks at what the military targets (usually called military/industrial targets) are in any real plan, one finds, for instance, that they include all the naval bases, which include most American big

cities on the coasts. One finds that they also include the major centers of command, communication, transportation, etc., and that striking these military/industrial targets in a way designed to remove the enemy's military capability leads to a number of potential civilian casualties that is at least as large as the number that would be inherent in a deliberate attack involving a smaller number of weapons against the cities themselves. The main difference is that, in the case of an attack against the military targets, people are collateral damage; and, in the minimum deterrence case, they are deliberate damage. I do not see an important moral distinction between those two cases. I do agree



Presidents Kennedy and Johnson, as cutting to the core of the situation. In sum, he said that, in the real world of real political leaders, any policy, which in advance was known to bring a single hydrogen weapon on a city of one's own country, would be regarded in advance as a catastrophic blunder. Ten weapons on one's own country would be a disaster beyond history, and then he ended by saying that 100 is unthinkable. So the number that is necessary to deter at least the people that I have some direct understanding of (Western and American leaders) is somewhere in the range of 1, 10, or 100. I think that it is closer to 1 than it is to 100, but of course there has to be some reasonable assurance of the likelihood that nuclear retaliation really would happen for that deterrence to be effective.

50 I am not sure about other leaders. Names of supposedly irresponsible third world leaders are often thrown out, and the suggestion is made that the people who took so many tens of millions of casualties in World War II cannot be deterred merely by the threat of the loss of a single city, or that there will always be crazy people out there. And there may very well be irrational people with nuclear weapons, but I do not think they practice the kind of calculus that is relevant to the notion that even 5000 deter. Thus, as far as rational people approaching the question of nuclear weapons falling on themselves, somewhere between 1, 10, and 100 is the answer to what it takes to deter, and for irrational leaders there may be no answer at all.

Coming from the top down, one criticism of reductions, which people who are fairly passionate about these questions sometimes make, is that it does not make any difference. Drop the number from 12,000 to 6000, and the effect of 6000 on civilization and mankind is nearly the same as the effect of 12,000, so it does not make any difference. Or drop from 6000 to 3000, and it does not make much difference either, because 3000 weapons still contain such an enormous capability for death and destruction. I admit there is something to that notion although it clearly depends on precisely how they are targeted. But there is a point at which reductions begin to make a real difference, and that point is where the number of weapons has been cut to the point that no matter how the leaders decided to use them, they could not produce something substantially worse than War World II. I do not know exactly where that point is, but I estimate that it is somewhere in the neighborhood of 100. I am sure it is not in the neighborhood of 1000. It may in truth be less than 100, but it is somewhere in that neighborhood.

I simply cannot be more precise than this, but I have given you my two ways of approaching this number, coming from the bottom up and trying to think of what it would really take to deter an American President or someone else who thinks rationally, and coming down from the top and trying to arrive at a number where the reduction really would make a difference, and where no matter what the later decisions might be, the result would be no worse than, as I said, World War II.

## Moral Issues

Turning to the moral issues, it is commonly said that deliberately targeting cities is simply unacceptable and that we must have some kind of strategy based on destroying military targets. A lot of what Richard Wagner said in his discussion at this Workshop is relevant to this. My particular answer to this problem is that the other strategies, the strategies that involve so-called military targets or counterforce strategies, always necessarily involve a much larger number of nuclear weapons. By the time one looks at what the military targets (usually called military/industrial targets) are in any real plan, one finds, for instance, that they include all the naval bases, which include most American big

cities on the coasts. One finds that they also include the major centers of command, communication, transportation, etc., and that striking these military/industrial targets in a way designed to remove the enemy's military capability leads to a number of potential civilian casualties that is at least as large as the number that would be inherent in a deliberate attack involving a smaller number of weapons against the cities themselves. The main difference is that, in the case of an attack against the military targets, people are collateral damage; and, in the minimum deterrence case, they are deliberate damage. I do not see an important moral distinction between those two cases. I do agree